

OXYGEN ION TRANSPORT MEMBRANE APPARATUS AND PROCESS
FOR USE IN SYNGAS PRODUCTION

Abstract

A reaction vessel for the production of synthesis gas that contains four subassemblies: (1) a first heat exchanger that transfers heat between two low pressure streams (an oxygen containing stream and an oxygen depleted stream); (2) a second heat exchanger that transfers heat between two high pressure fluid streams (a hydrocarbon-containing reactant stream and a synthesis gas product stream); (3) mixed conductor ceramic membranes; and (4) a catalyst bed. Each of these subassemblies are configured so that they freely expand or contract independently from each other, and to thus avoid inducing high mechanical loads and damaging material stresses.

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